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of approach, at the same time broadening the lines. It will be easy for the reader to determine the effect of a motion of either kind in a streamer making a given angle with the observer's line of sight, and space will not be taken here to summarize further the general effect. It is evident that a dark-line spectrum, if one of sufficient density and dispersion could be obtained, would be of great complexity. However, a knowledge of the motions within the corona would doubtless be our most effective power in determining the origin of the corona, and the subject should not be abandoned as hopeless.

PLANETARY PHENOMENA FOR MAY AND JUNE, 1907.

By Malcolm McNeill.

PHASES OF THE MOON, PACIFIC TIME.

Last Quarter..	May 4,	$1^h\,53^m$ P.M.	Last Quarter..	June 2,	$9^h\,20^m$ P.M.
New Moon....	" 12,	12 59 A.M.	New Moon....	" 10,	3 50 P.M.
First Quarter..	" 20,	5 27 A.M.	First Quarter..	" 18,	6 55 P.M.
Full Moon....	" 27,	6 18 A.M.	Full Moon....	" 25,	1 27 P.M.

The summer solstice, the time when the Sun stops moving north and begins to move south, occurs June 22d, 6 A.M., Pacific time.

Mercury is a morning star on May 1st, rising less than an hour before sunrise, and is therefore too near the Sun for naked-eye observation. It moves rapidly toward the Sun, and passes superior conjunction, becoming an evening star, on the night of May 23d-24th. It then moves rapidly away from the Sun and a little northward. Shortly after June 1st it remains above the horizon an hour after sunset, and this period increases to about an hour and three quarters soon after the middle of the month. It then begins to shorten, but does not go below an hour and one half until after the close of the month. Greatest east elongation (25° 29′) is reached on June 27th. This is not quite the maximum possible, but is not much below it. The month of June this year therefore gives about the best opportunity for naked-eye views of *Mercury*.

Venus remains a morning star, rising $1^h\ 20^m$ before sunrise on May 1st, and this interval remains about the same throughout the two-month period, even increasing a little toward the end of the period, although the apparent distance between planet and Sun is diminishing, the distance apart of the two bodies being 8° less at the end of the period than it was at the beginning. Although the planet is very low down until nearly the time of sunrise, its brightness is so great that there will be no difficulty in seeing it during the early twilight.

Mars rises shortly before midnight on May 1st, before $10^h\ 30^m$ on June 1st, and before $8^h\ 30^m$ on June 30th. It moves eastward about 7° until June 5th, and from that time until the end of the month it moves westward about 4°. It remains in *Sagittarius,* north of the "milk-dipper" group. Its distance diminishes from sixty-nine millions of miles on May 1st, to fifty millions on June 1st, and thirty-nine millions on June 30th. At the last date its distance is only about one million miles greater than the minimum, which will be reached early in July. The planet will still gain materially in brightness all through the period, and will practically have attained its maximum at the end of June. It will then be about as bright as Jupiter. *Mars* will come to opposition on July 6th, and its nearest approach to the Earth will occur a few days later, the least distance being a little less than thirty-eight millions of miles. This is the most favorable opposition since that of 1892, which came on August 3d. The planet was then two and one-half millions of miles nearer the Earth than it will be during the present opposition,—not a great difference, but noticeable. The next opposition will come toward the end of September, 1909. This will be rather more favorable than the present one. The most favorable time is when opposition and perihelion come at about the same time. This happens when opposition occurs near the end of August. The present opposition occurs eighty-two days before time of perihelion; that of 1909 will occur about half of that time after perihelion. The sidereal period of *Mars* remains practically constant (687 days), somewhat less than two years. This is the time from one perihelion to the next. The synodic period, or time from opposition to opposition, averages 780 days, somewhat over two years, but is subject to considerable variation, about fifty days, the longest period coming when opposition occurs near time of perihelion. From the last opposition to the present one the interval is 788 days, and the next period will be considerably longer. The cause is the eccentricity of *Mars's* orbit, and the consequent variability in the velocity of the planet.

Jupiter sets shortly before $11^h\ 30^m$ P.M. on May 1st, and shortly after 8^h P.M. on June 30th. It moves eastward about 13° in the constellation *Gemini* and at the close of the period is nearly due south of *Castor* and *Pollux,* the principal stars of the constellation. It is in conjunction with *Mercury* on June 15th, the latter passing 1° 41′ to the north.

Saturn is a morning object, rising somewhat less than two hours before sunrise on May 1st, at $1^h\ 26^m$ A.M. on June 1st, and at $11^h\ 35^m$ P.M. on June 30th. It moves about 3° eastward and 2° northward in the constellation *Pisces,* and at the end of June is only about 2° distant from the point marking the vernal equinox. The rings are practically out of sight during May and June, as the Earth and Sun are on opposite sides of the plane. Large telescopes may show the edge illuminated, and possibly light may pass through small gaps in the rings. A better opportunity for seeing the same phenomenon will come during the autumn, when Earth and Sun will have changed places relative to the rings.

Uranus rises shortly before midnight on May 1st, and shortly before 8^h P.M. on June 30th. It is still in the constellation *Sagittarius* and moves westward about 2° during the two months. It is in conjunction with *Mars* on May 1st, which passes between it and the "milk-dipper" group at a distance of 0° 46′ from *Uranus.*

Neptune is in *Gemini* not far from *Jupiter.* The time of nearest approach is May 21st. *Jupiter* then passes 1° north of *Neptune.*

(FIFTY-SIXTH) AWARD OF THE DONOHOE COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to Dr. A. KOPFF, astronomer, Heidelberg, Germany, for his discovery of an unexpected comet on August 22, 1906.

Committee of the Comet-Medal:
W. W. Campbell,
Chas. Burckhalter,
C. D. Perrine.

San Francisco, March 20, 1907.

(FIFTY-SEVENTH) AWARD OF THE DONOHOE COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to Professor H. Thiele, astronomer, Copenhagen, Denmark, for his discovery of an unexpected comet on November 20, 1906.

Committee on the Comet-Medal:
W. W. Campbell,
Chas. Burckhalter,
C. D. Perrine.

San Francisco, March 20, 1907.

(FIFTY-EIGHTH) AWARD OF THE DONOHOE COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to J. H. Metcalf, astronomer, Taunton, Massachusetts, for his discovery of an unexpected comet on November 14, 1906.

Committee of the Comet-Medal:
W. W. Campbell,
Chas. Burckhalter,
C. D. Perrine.

San Francisco, March 20, 1907.

LIBRARY NOTICE.

Members who had in their possession at the time of the San Francisco fire any books or pamphlets belonging to the Library of the Astronomical Society of the Pacific are requested to send them to the Librarian of the Society, R. T. Crawford, Students' Observatory, Berkeley, Cal.